Written by Administrator Saturday, 07 November 2009 07:47 -

Operating Systems

Subject Code

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06EC751 IA Marks

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25

No. of Lecture Hrs/ Week

:

Written by Administrator Saturday, 07 November 2009 07:47 -

Exam Hrs

:

03

Total no. of Lecture Hrs.

:

52

Exam Marks

:

100

PART - A

Written by Administrator Saturday, 07 November 2009 07:47 -

n And Overview Of Operating SYSTEMS:

Operating system, Goals of an O.S, Operation of an O.S, Resource allocation and related functions, User interface related functions, Classes of operating systems, O.S and the computer system, Batch processing system, Multi programming systems, Time sharing systems, Real time operating systems, distributed operating systems.

6 Hours

Structure of the Operating Systems: Operation of an O.S, Structure of the supervisor, Configuring and installing of the supervisor, Operating system with monolithic structure, layered design, Virtual machine operating systems, Kernel based operating systems, and Microkernel based operating systems.

7 Hours

Unit - 3

Process Management: Process concept, Programmer view of processes, OS view of processes, Interacting processes, Threads, Processes in UNIX, Threads in Solaris.

6 Hours

Written by Administrator Saturday, 07 November 2009 07:47 -

Memory Management: Memory allocation to programs, Memory allocation preliminaries, Contiguous and noncontiguous allocation to programs, Memory allocation for program-controlled data, kernel memory.

6 Hours

PART - B

Virtual Memory: Virtual memory basics, Virtual memory using paging, Demand paging, Page replacement, Page replacement policies, Memory allocation to programs, Page sharing, UNIX virtual memory.

6 Hours

File Systems: File system and IOCS, Files and directories, Overview of I/O organization, Fundamental file organizations, Interface between file system and IOCS, Allocation of disk space, Implementing file access, UNIX file system.

Written by Administrator Saturday, 07 November 2009 07:47 -

Scheduling: Fundamentals of scheduling, Long-term scheduling, Medium and short term scheduling, Real time scheduling, Process scheduling in UNIX.

7 Hours

Message Passing: Implementing message passing, Mailboxes, Inter process communication in UNIX).

6 Hours

Text book:

2006.

Reference book:

Written by Administrator Saturday, 07 November 2009 07:47 -

1. **Operating** Systems Concepts – Silberschatz and Galvin, John Wiley, 5th Edition, 2001.

2. **Operating** System – Internals and Design Systems – Willaim Stalling, Pearson

Education, 4

Ed, 2006.

DIGITAL SIGNAL COMPRESSION

Subject Code

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Written by Administrator Saturday, 07 November 2009 07:47 -

25

No. of Lecture Hrs/ Week

:

04

Exam Hrs

03

:

Total no. of Lecture Hrs.

:

52

Exam Marks

Written by Administrator Saturday, 07 November 2009 07:47 -

:

100

PART - A

Introduction: Compression techniques, Modeling & coding, Distortion criteria, Differential Entropy, Rate Distortion Theory, Vector Spaces, Information theory, Models for sources, Coding – uniquely decodable codes, Prefix codes, Kraft McMillan Inequality.

6 Hours

Unit - 2

Quantization: Quantization problem, Uniform Quantizer, Adaptive Quantization, Non-uniform Quantization; Entropy coded Quantization, Vector Quantization, LBG algorithm, Tree structured VQ, Structured VQ, Variations of VQ – Gain shape VQ, Mean removed VQ, Classified VQ, Multistage VQ, Adaptive VQ, Trellis coded quantization

6 Hours

Written by Administrator Saturday, 07 November 2009 07:47 -

 Differential Encoding: Basic algorithm, Prediction in DPCM, Adaptive DPCM, Delta

 Modulation, Speech coding – G.726, Image coding.

 Description

Transform Coding:

Transforms – KLT, DCT, DST, DWHT; Quantization and coding of transform coefficients, Application to Image compression – JPEG, Application to audio compression.

7 Hours

Sub-band Coding: Filters, Sub-band coding algorithm, Design of filter banks, Perfect reconstruction using two channel filter banks, M-band QMF filter banks, Poly-phase decomposition, Bit allocation, Speech coding – G.722, Audio coding – MPEG audio, Image compression.

5 Hours

PART - B

Written by Administrator Saturday, 07 November 2009 07:47 -

Wavelet Based Compression: Wavelets, Multiresolution analysis & scaling function, Implementation using filters, Image compression – EZW, SPIHT, JPEG2000. Analysis/Synthesis Schemes: Speech compression – LPC-10, CELP, MELP, Image Compression – Fractal compression.

6 Hours

VideoCompression: Motion compensation, Video signal representation, Algorithms for video conferencing & videophones – H.261, H. 263, Asymmetric applications – MPEG 1, MPEG 2, MPEG 4, MPEG 7, Packet video.

6 Hours

Unit – 7 &8 Huffman coding, Adaptive Huffman coding, Golomb codes, Rice codes, Tunstall codes, Applications of Huffman coding, Arithmetic coding, Algorithm implementation, Applications of Arithmetic coding, Dictionary techniques – LZ77, LZ78, Applications of LZ78 – JBIG, JBIG2, Predictive coding – Prediction with partial match, Burrows Wheeler Transform, Applications – CALIC, JPEG-LS, Facsimile coding – T.4, T.6.

Written by Administrator Saturday, 07 November 2009 07:47 -

Reference BOOKs:

1. **Introduction to Data Compression** – K. Sayood, Harcourt India Pvt. Ltd. & Morgan Kaufmann Publishers, 1996.

- 2. Digital Coding of Waveforms N. Jayant and P. Noll,
- 3. **Principles** and Applications to Speech and Video Prentice Hall, USA, 1984.

4. Data Compression: The Complete Reference – D. Salomon,"," Springer, 2000.

5. **Fundamentals** of Multimedia – Z. Li and M.S. Drew, "," Pearson Education (Asia) Pte. Ltd., 2004.

Written by Administrator Saturday, 07 November 2009 07:47 -

Artificial Neural Networks

Subject Code

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25

No. of Lecture Hrs/ Week

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04

Exam Hrs

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Written by Administrator Saturday, 07 November 2009 07:47 -

Total no. of Lecture Hrs.

:

52

Exam Marks

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100

PART - A

Introduction :

Н

istory, structure and function of single neuron, neural net architectures, neural learning, use of neural networks.

Written by Administrator Saturday, 07 November 2009 07:47 -

upervised learning, single layer networks, perceptions, linear separability, perceptions training algorithm, guarantees of success, modifications.

6 Hours

UnIT - 3

Multiclass networks-I, multilevel discrimination, preliminaries, backs propagation, setting parameter values, theoretical results.

6 Hours

Unit - 40

Accelerating learning process, application, mandaline, adaptive multilayer networks.

7 Hours

PART - B

Written by Administrator Saturday, 07 November 2009 07:47 -

Prediction networks, radial basis functions, polynomial networks, regularization, unsupervised learning, winner take all networks.

6 Hours

Unit - 60

Learning vector quantizing, counter propagation networks, adaptive resonance theorem, toplogically organized networks, distance based learning, neo-cognition.

7 Hours

Associative models, hop field networks, brain state networks, Boltzmann machines, hetero associations.

7 Hours

Written by Administrator Saturday, 07 November 2009 07:47 -

Optimization using hop filed networks, simulated annealing, random search, and evolutionary computation.

6 Hours

Text book:

1. **Elements of artificial neural networks** – Kishan Mehrotra, C. K. Mohan, Sanjay Ranka, , Penram, 1997.

Written by Administrator Saturday, 07 November 2009 07:47 -

Reference Books:

- 1. Artificial neural networks- R. Schalkoff, , MGH, 1997.
- 2. Introduction to artificial neural systems J. Zurada, Jaico, 2003.
- 3. Neural networks Haykins, Pearson Edu., 1999.

CAD for VLSI

Subject Code

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Written by Administrator Saturday, 07 November 2009 07:47 -

25

No. of Lecture Hrs/ Week

:

04

Exam Hrs

03

:

Total no. of Lecture Hrs.

:

52

Exam Marks

Written by Administrator Saturday, 07 November 2009 07:47 -

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100

PART - A

Introduction to VLSI layout: Cad tools, Philiosophy of VLSI, N-MOS and P-MOS transistor structures, scalability, design requirements, Hierarchical representation, testability enhancement, combinational logic.

4 Hours

Hardware Modeling: Hardware modeling languages, abstract model, compilation and behavioral optimization.

5 Hours

Written by Administrator Saturday, 07 November 2009 07:47 -

Scheduling Algorithms: Introduction, A model for scheduling problems, scheduling without and with resource constraints, scheduling algorithms for extended sequencing models, scheduling pipelined circuits.

7 Hours

Resource Sharing and Binding: Introduction, sharing and binding for resource – dominated circuits, sharing and binding for general circuits.

6 Hours

PART - B

Logic Level Synthesis and Optimization: Two level combinational logic optimization, Introduction, Logic optimization principles, operations on two level logic covers, algorithms for logic minimization, symbolic minimization and encoding problems, minimization for Boolean relations.

Written by Administrator Saturday, 07 November 2009 07:47 -

Multilevel Combinational Logic Optimization: Introduction, models and transformation for combinational networks, algeberic models, Boolean models.

9 Hours

Sequential Logic Optimization: Introduction, Sequential Circuit, Optimization using state – base models.

3 Hours

Testability of VLSI: Introduction, Shadow registers and scan design, counter testability, testing stuck – At faults, Boolean differences, PLA testgability, PLA performance estimation, Design simulation.

8 Hours

Text Books:

Written by Administrator Saturday, 07 November 2009 07:47 -

Introduction to VLSI Design – Eugune D Fabricius, MGH, 1990
 Synthesis and Optimization of digital circuits – Giovanni De Micheli, MGH
 1994

ATM Networks

Subject Code

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Written by Administrator Saturday, 07 November 2009 07:47 -

No. of Lecture Hrs/ Week

:

04

Exam Hrs

:

03

Total no. of Lecture Hrs.

:

52

Exam Marks

:

Written by Administrator Saturday, 07 November 2009 07:47 -

PART - A

6 Hours

ATM Reference Model: Core aspects, ATM Networks, Architecture and interfaces, Internetworking, Applications, BISDN and ATM, ATM Standardization.

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ATM Physical Layer: TC sub layer, PMD sub layer, DS1 interface, DS3 interface, E1 Interface, E3 interface, SONET/SDH based interface.

6 Hours

ATM Layer and AAL, ATM cell header at UNI and NNI, ATM layer function, AAL1, AAL2, AAL3/4.

8 Hours

PART - B

Written by Administrator Saturday, 07 November 2009 07:47 -

ATM traffic and traffic management: Traffic parameters, Service parameters, QOS parameters, Service categories, Traffic management, Traffic contact management.

6 Hours

ATM Switching: Introduction, Components, Performance, Measurements, Switching issues, Shared memory architecture, Shared medium architecture, Space division architecture, Switching in ATM.

8 Hours

ATM Addressing, Signaling AND ROUTING: AISA format, Group addressing, ATM signal protocol stack, SAAL, Routing, PNNI Protocol, PNNI hierarchy, PNNI topology.

Written by Administrator Saturday, 07 November 2009 07:47 -

ATM NETWORK MANAGEMENT AND SECURITY: Standardization Procedure, Reference model, OAM Procedure, ILMI, Security object in ATM Security model.

6 Hours

Text BOOK:

1. **ATM Networks** – Sumit Kasera and Pankaj Sethi, TMH, 2001.

Reference Books:

1. **ATM** Networks – Rainer Handel, Manfred. N. Huber, Stefan Schroder, 3rd Edi

Written by Administrator Saturday, 07 November 2009 07:47 -

tion, Pearson Education Asia, 2006.

2. **Sourcebook** of ATM and IP internetworking– Khalid Ahmed, Wiley inter science, 2002.

Image Processing

Subject Code

:

	06EC756
IA Marks	

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Written by Administrator Saturday, 07 November 2009 07:47 -

No. of Lecture Hrs/ Week

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04

Exam Hrs

:

03

Total no. of Lecture Hrs.

:

52

Exam Marks

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Written by Administrator Saturday, 07 November 2009 07:47 -

PART - A

Digital Image Fundamentals: What is Digital Image Processing. Fundamental Steps in Digital Image Processing, Components of an Image processing system, elements of Visual Perception.

6 Hours

Image Sensing and Acquisition:Image Sampling and Quantization, Some BasicRelationshipsbetween Pixels, Linear and NonlinearOperations.I

6 Hours

Image Transforms: Two-dimensional orthogonal & unitary transforms, properties of unitary

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transform, two dimensional discrete Fourier transform.

6 Hours

Discrete cosine transform, sine transform, Hadamard transform, Haar transform, Slant transform, KL transform.

6 Hours

PART - B

Image Enhancement: Image Enhancement in Spatial domain, Some Basic Gray Level Trans -formations, Histogram Processing, Enhancement Using Arithmetic/Logic Operations.

6 Hours

Basics of Spatial Filtering Image enhancement in the Frequency Domain filters, Smoothing Frequency Domain filters, Sharpening Frequency Domain filters, homomorphic filtering.

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6 Hours

Model of image degradation/restoration process, noise models, Restoration in the Presence of Noise, Only-Spatial Filtering Periodic Noise Reduction by Frequency Domain Filtering, Linear Position-Invariant Degradations, inverse filtering, minimum mean square error (Weiner) Filtering.

10 Hours

Color Fundamentals: Color Models, Pseudo color Image Processing., processing basics of full color image processing.

Written by Administrator Saturday, 07 November 2009 07:47 -

Text Book:

1 **Digital Image processing**– Rafael C.Gonzalez and Richard E.Woods, Pearson Education, 2001, 2 nd edition.

Reference Books:

1. Fundamentals of Digital Image Processing – Anil K. Jain, Pearson Edun, 2001.

2. **Digital Image Processing and Analysis** – B. Chanda and D. Dutta Majumdar, PHI, 2003.

Written by Administrator Saturday, 07 November 2009 07:47 -

Video Engineering

Subject Code

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25

No. of Lecture Hrs/ Week

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04

Exam Hrs

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Written by Administrator Saturday, 07 November 2009 07:47 -

03

Total no. of Lecture Hrs.

:

52

Exam Marks

100

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PART - A

TV Fundamentals: Block schematic of TV systems, picture characteristics, luminous signal, bandwidth calculation, chromatic signal, composite video signal.

Written by Administrator Saturday, 07 November 2009 07:47 -

6 Hours

NTSC, PAL and SECAM Overview: NTSC overview, luminous information, color information, color modulation, composite video generation, color sub-carrier frequency, NTSC standards, RF modulation, stereo audio. PAL overview, luminance information, color information, color modulation, composite video generation, PAL standards, RF modulation, stero audio (analog).

SECAM overview, luminance information, color information, color modulation, composite video generation, SECAM standards, Tele text, Enhanced TV programming.

6 Hours

NTSC and PAL digital encoding – decoding: NTSC & PAL encoding, luminance, Y processing, color difference processing, C modulation, analog C generation, analog composite video, clear encoding, NTSC & PAL decoding.

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Video conferencing standards: (H.261 & H.263) - H.261, video coding layers, DCT, IDCT, video bit stream, block layer, still image transmission, H.263, video coding layer, GOB layer, MB layer, optional H.263 modes.

6 Hours

PART - B

Unit - 5 & 6

MPEG 1, 2, 4 and H.261: Introduction, MPEG vs JPEG, Quality issues, audio overview, vide o coding layer, I P B, D frames, video bit stream, video decoding, real world issues.

MPEG 2: Introduction, audio overview, video overview, video coding layer, enhances TV programming,

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IPMP.

MPEG 4 over MPEG 2, H.264 over MPEG 2, SMPTEVC-9 over MPEG 2, Data broad casting, decoder consideration. MPEG 4 & H.264: Introduction, audio overview, visual overview, Graphic overview, visual layer, object description frame work, scene description, syndronigation of elementary streams, multiplexing, IPMP, MPEG 4 part 10 (H.264) video.

15 Hours

Digital video interfaces: pre video component interfaces, consumer component interfaces, consumer transport interfaces.

Digital video processing: Rounding considerations, SDTV – ADTV Yeber transforms, 4:4:4 to 4:2:2 Yeber conversion, display enhancement, video mixing and graphic overlay.

IPTV: consideration, multicasting, RTS based solutions, ISMA, Broadcast over IP, DRM.

Written by Administrator Saturday, 07 November 2009 07:47 -

Text Book:

1. **Video Demystified** – Keith Jack, 4th Edn, Elsevier, 2007.

Reference Book:

2. Modern TV Practice – R.R.Gulati, 2nd Edn, New age Intl. publications.